

DIGITAL RECEIVER FAST FREQUENCY AND
TIME ACQUISITION SYSTEM USING A SINGLE SYNCHRONIZATION WORD
AND METHOD OF USING SAME

5

ABSTRACT OF THE DISCLOSURE

A digital receiver fast frequency and time acquisition system(200) for accurately providing both time and frequency
10 synchronization to an incoming data stream with minimal
delay to prevent any loss of incoming digital information.
The invention provides synchronization with only a single
synchronization word and includes a first channel select
(CS) filter (204) that filters an incoming digital signal
15 (202). A frame synchronization detector (206) then
recognizes the time synchronization word from the first
filtered signal. A coarse symbol time estimator (208) is
then used for coarsely adjusting the time synchronization of
the digital signal from the frame synchronization detector
20 (206) and a fine frequency estimator (210) finely adjusts
the frequency of the signal from the coarse symbol time
estimator (208) for providing a frequency adjusted signal.
A mixer (212) then combines the incoming digital signal with
the frequency adjusted signal and provides a time and
25 frequency compensated digital signal. A second CS filter
(214) filters the frequency compensated digital signal and a
fine symbol time estimator (216) works to determine symbol
timing with greater precision. Finally, a symbol detector
(218) is used for interpreting the incoming digital signal.

30